

### **REMARKS/ARGUMENT**

Claims 1-16, and 26 are pending after entry of the present Amendment. No new matter is introduced.

#### **Election/Restrictions**

Applicants acknowledge that the Office declines to examine newly submitted claim 32. The Office supports a different species rationale citing that the trench dielectric layer is not limited to carbon-doped silicon dioxide. Accordingly, the claim has been withdrawn.

#### **Rejections under 35 USC §103**

Claims 1-4, 10, 11, and 14-16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Aoi (U.S. Patent No. 5,619,696), in view of Jang (U.S. Patent No. 6,110,648). This rejection is respectfully traversed, and Applicants request reconsideration.

The Office has described the patent to Aoi to define a first and a second dielectric layer having similar properties to the presently claimed invention. One significant characteristic that the reference does not teach is the claimed via dielectric thickness of between 0.4 and 0.5 microns and trench dielectric thickness of between 0.5 and 0.6 microns. The resulting material properties, for example the resulting dielectric constant of the structure, define materially different structures. Therefore, the structure as taught by Aoi has a silicon dioxide film formed to 1 micron in thickness and an organic film formed to 0.4 microns (col. 19, lines 5-7). The structure taught by Aoi is therefore materially different than the presently claimed structure in both the thickness of the individual layers or films and in the ratio of thickness between the via and trench dielectric layers. The presently claimed structure then operates in a materially distinct manner than the structure as taught by Aoi.

The patent to Aoi does not teach each and every element as set forth in Applicants' independent claims 1 and 10. The Office has therefore selected the patent to Jang to be combined with the Aoi reference in order to capture the missing elements or features. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the reference or in the knowledge generally available to one having ordinary skill in the art, to modify the reference. Additionally, there must be a reasonable expectation of success, and the reference when modified must teach or suggest all of the claim features. Modifications to prior art that are within the skill of one of ordinary skill in the art at the time of invention is insufficient to establish a *prima facie* case of obviousness without some objective reason to modify. The mere fact that a reference can be modified does not render the

resultant modification obvious unless the prior art also suggest the desirability of the combination. (See MPEP §2143.) That is, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in the Applicants' disclosure. Applicants respectfully submit that a *prima facie* case of obviousness is not supported against Applicants' independent claims 1 and 10.

The Office states that "Jang -- like Aoi -- teaches a dual damascene process wherein the via 120a and trench 120b dielectric layers are made of different dielectric layers including an oxide and a low-k dielectric. Accordingly, Jang and Aoi are drawn to the same field of endeavor." However broadly the lines may be drawn to define "field of endeavor" or perhaps "species of invention," motivation to combine remains a requirement to support a *prima facie* case of obviousness. The Office has failed to provide a credible motivation to combine the cited references.

The Office has declined to examine Applicants' new claim 32 (now withdrawn) by stating that the claim defines an invention that is independent or distinct from the invention originally claimed because the trench dielectric layer is not limited to carbon-doped silicon oxide. Applicants point out that the patent to Jang does not include carbon-doped silicon oxide. According to Jang, "Both lower (LLD) and upper (ULD) layers shown in FIG. 3a may be formed from materials including but not limited to silicon oxide materials, silicon nitride materials, and silicon oxynitrides materials formed within integrated circuits through methods including but not limited do (sic) CVD, PECVD, PVD sputtering method. For the preferred embodiment of the present invention, LLD layer (120a) comprises an oxide or a low-k (dielectric) polymer having a thickness between about 5000 to 8000 angstroms (Å), while ULD layer (120b) also comprises an oxide or low-k polymer, but with a thickness between about 5000 to 9000 Å" (col. 5, lines 41-52). In an alternative embodiment, Jang teaches "LLD layer (120a) comprises undoped oxide, or low-k oxide, or low-k polymer having a thickness between about 5000 to 9000 angstroms (Å), and same with ULD layer (120b) with a thickness between about 5000 to 9000 Å" (col. 7, lines 18-22). It would seem, then, that since Jang doesn't include teaching carbon-doped silicon oxide, and in one embodiment *excludes* carbon doped silicon oxide (*comprises undoped oxide*), such independent or distinct inventions would *teach away* from the combination asserted by the Office.

Applicant further points out that motivation for combination is severely lacking, and that the Office fails to acknowledge, in the invention of Jang due to the presence and use of an etch stop layer 125 in each of the structures. The etch stop layer 125 is described to have a

thickness between about 500 to 1500 Å, but more importantly, the addition of the etch stop layer fundamentally changes the material properties of the structure. There is no motivation to simply use the layer thickness of Jang in the structure of Aoi, because of the structural and material differences of the structures that the Office as suggested to combine.

For at least the above reasons, Applicant respectfully submits that the Office has failed to establish and support an *prima facie* case of obviousness against Applicants' independent claims 1 and 10. Claims 2-4, 11, and 14-16 each depend, directly or indirectly, from one of independent claims 1 and 10, and therefore no *prima facie* case of obviousness is supported against these claims either. Applicants therefore respectfully request reconsideration of these claim rejections, and that the rejections be withdrawn.

Claims 5, 7-9, and 12 were rejected under 35 USC §103(a) as being unpatentable over Aoi in view of the basic text of *Wolf et al.*, Silicon Processing for the VLSI Era, Vol. 2 - Process Integration, Lattice Press; Sunset Beach, CA, 1990, p. 194. Applicants respectfully traverse this rejection, and request reconsideration.

For at least the reasons recited above, Applicants' submit that the combination of Aoi and Jang fails to render Applicants' independent claims 1 and 10 obvious. *Wolf et al.* appears to be combined with the Aoi and Jang combination to capture the features in dependent claims 5, 7-9, and 12 that are not taught or suggested by either the patent to Aoi or the patent to Jang. As described above, Applicants' independent claims 1 and 10 claim a different and distinct structure from that taught by Aoi, or the combination of Aoi and Jang. Even if the basic text of *Wolf et al.* were to teach the additional features recited in dependent claims 5, 7-9, and 12, the combination still fail, at least, for lack of motivation to combine. Applicants therefore respectfully request that these §103 rejections be withdrawn.

Claims 6 and 13 were rejected under 35 USC §103(a) as being unpatentable over Aoi in view of Jang, and further in view of Lee et al., (U.S. Patent No. 6,043,167). Applicants respectfully traverse this rejection, and request reconsideration.

For the same reasons cited above with respect to the rejection of claims 5, 7-9, and 12, Applicants submit that the combination of Aoi, Jang, and Lee et al. fail to establish or support a *prima facie* case of obviousness against Applicants' independent claims 1 and 10. Therefore, the asserted combination likewise fails to support a *prima facie* case of obviousness against dependent claims 6 and 13, which depend directly or indirectly from one of

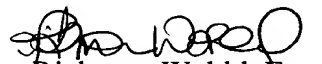
independent claims 1 and 10. Applicants therefore respectfully request that these §103 rejections be withdrawn.

Claim 26 was rejected under 35 USC §103(a) as being unpatentable over Aoi in view of Jang, and further in view of Chen et al., (U.S. Patent No. 5,989,623). Applicants respectfully traverse this rejection, and request reconsideration.

For the same reasons cited above with respect to the rejection of claims 5, 7-9, and 12, Applicants submit that the combination of Aoi, Jang and Chen et al. fail to support a *prima facie* case of obviousness against Applicants' independent claim 10. Therefore, the asserted combination likewise fails to support a *prima facie* case of obviousness against dependent claim 26, which depends directly from independent claim 10. Applicants therefore respectfully request that this §103 rejection be withdrawn.

In view of the foregoing, Applicants respectfully request reconsideration of claims 1-16, and 26. Applicants submit that all claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. If Examiner has any questions concerning the present Amendment, the Examiner is kindly requested to contact the undersigned at (408) 749-6900, ext. 6905. If any additional fees are due in connection with filing this amendment, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. LAM1P106A). A copy of the transmittal is transmitted herewith for this purpose.

Respectfully submitted,  
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